

Chapter 2

Welfare Economics for Price Changes

2.1 Introduction

The phrase *environmental valuation* has come to be applied to the practice of evaluating the social gains and losses from environmental degradation or improvement. Economists practice valuation by applying welfare economics to environmental outcomes. There is, of course, a good deal of debate as to what is meant by valuation, particularly among the broader science community. Evaluation of benefits and costs often evokes strong objections, even when applied in the well-defined context of welfare economics. Because the objections have an even greater propensity to emerge in environmental applications, the principles of applied welfare economics deserve a quick reminder. This chapter reviews the theory of welfare measurement, but as with the entire book, the ultimate empirical application remains foremost in our minds. The methods for recovering the welfare measures we seek (or good approximations of them) are indirect and will depend on careful reasoning and sound econometrics. Although the importance of the econometric details can not be underestimated, in this book we focus on the logic that connects behavior with estimation.¹

Ultimately welfare economics is concerned with social choice—whether some states of the world are better than others. But because welfare economics is individualistic, in the sense that the well being of society is based on the well being of its individuals, we start with how we determine individual well being.

¹Haab and McConnell (2002) address many of the econometric issues that arise in using revealed and stated preference techniques in environmental valuation.

Here economics is unequivocal: an individual is the arbiter of his own welfare. When an individual faces two alternatives A and B and chooses A, we recognize that an individual is better off with A. We say he has ‘revealed his preference’ for A. Given the emphasis on revealed preferences, it may seem puzzling that all models begin with the individual maximizing an unobservable index we call utility. This puzzle is solved by showing that when individual behavior satisfies a set of plausible axioms of choice, the individual has a preference ordering that can be represented as a utility function.²

The puzzle of whether society is better off in different states has plagued economists for centuries. The concept of ‘utility’ that forms the basis of theoretical models of individual behavior cannot, on its own, provide what we need to answer the larger question of comparing social states. Utility is not measurable by researchers, nor is it likely to be measurable in a cardinal way even by individuals themselves; and it can not be compared across people. Further, Arrow (1951) and Samuelson (1956) have shown the impossibility of using a social welfare function to aggregate individual levels of utility or preferences to order different states. The familiar Pareto criterion (Pareto, 1896) avoids such meaningless pursuits and forms the logic underlying economists’ attempts to make normative statements about alternative ‘states of the world’. This criterion has become the basis for defining economic efficiency. An economically efficient solution is one in which no one can be made better off without making someone else worse off—the very statement of Pareto optimality. The Pareto criterion is appealing because only ordinal rankings of states by each individual is required. No cardinal measurement of preferences is needed, nor interpersonal utility comparisons. However the Pareto principle has at least two drawbacks. For one thing, it provides a very incomplete ordering of states. The Pareto criterion is almost never helpful in practice because most changes improve the well being of some while making others worse off. As a consequence, moves from the current situation (the *status quo*) are usually ruled out by this principle. The second and related drawback is that the Pareto criterion attributes to the *status quo* a preferred status that may be unwarranted. All is compared to the *status quo*, and no movement from this position is allowed if it harms anyone, even if that individual loses very little and is among the most well-off in society. In fact, the set of Pareto efficient solutions *depends* on the *status quo* (i.e. where we start from) and therefore depends on the distribution of initial endowments across individuals in society—a distribution that may or may not be considered ‘fair’ by society.³ Change those endowments and the

²These well known axioms are discussed in Deaton and Muellbauer (1980), chapter 2, or Cornes (1992), chapter 2.

³Endowments are best interpreted as wealth, natural ability, access to education, etc., rather than income which is effectively endogenous.